

Claims.

1. An elastomer material having an absorption coefficient for laser light of $0.5 - 2.5 \text{ mm}^{-1}$.
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2. An elastomer material according to claim 1 comprising a base thermoplastic elastomer compounded with a colourant to have the absorption coefficient for laser light of $0.5 - 2.5 \text{ mm}^{-1}$.
- 10 3. An elastomer material according to claim 1 or claim 3 wherein the base thermoplastic elastomer has a melting point of 200°C or less.
4. An elastomer material according to claim 2 or 3 wherein the base thermoplastic elastomer is a styrene-ethylene/butylene-styrene thermoplastic
15 elastomer, or a styrene/butadiene/styrene tri-block copolymer or styrene-(butadiene/butylene)-styrene tri-block copolymer.
5. An elastomer material according to claim 2, 3 or 4 wherein the base thermoplastic elastomer is selected from the materials Evoprene™, Cawiton™, and
20 C-Flex.
6. An elastomer material according to any one of claims 2 to 5 wherein the colourant comprises a pigment or mixture of pigments mixed with a carrier material.
- 25 7. An elastomer material according to claim 6 wherein the pigment or mixture thereof has the colour Pantone 5497C, 556C, 5565C, 563C, 570C, 555C or a similar grey or grey-green colour.
8. An elastomer material according to claim 6 or 7 wherein the colourant
30 comprises a mixture of the pigments: white 6, black 7, green 7 and blue 29.

9. An elastomer material according to claim 6, 7 or 8 wherein the carrier material comprises ethylene vinyl acetate, low density polyethylene or polypropylene
10. An elastomer material according to any one of claims 7 to 10 wherein the
5 colourant comprises 10 – 50 wt.% pigment, the balance up to 100% comprising the carrier material.
11. An elastomer material according to any one of claims 7 to 11 comprising 1 –
15 15wt.% of colourant the balance up to 100% comprising the base thermoplastic elastomer.
12. An elastomer material according to claim 1 which comprises Evoprene™
Super G, compounded with 1 – 5 wt% of a colourant masterbatch comprising an
ethylene vinyl acetate carrier with 35 - 45wt% of pigment of a colour Pantone 5497C,
15 556C, 5565C, 563C, 570C, 555C or a similar grey or grey-green colour.
13. An elastomer material according to claim 1 which comprises Evoprene™
TS2525, compounded with 1 – 5 wt% of a colourant masterbatch comprising an
ethylene vinyl acetate carrier with 35 - 45wt% of pigment of a colour colour Pantone
20 5497C, 556C, 5565C, 563C, 570C, 555C or a similar grey or grey-green colour.
14. An elastomer material according to claim 1 which comprises Cawiton™
PR5947, compounded with 3 - 15 wt% of a colourant masterbatch comprising an
LDPE carrier with 15 – 20 wt% of pigment of a colour Pantone 5497C, 556C, 5565C,
25 563C, 570C, 555C or a similar grey or grey-green colour.
15. An elastomer material according to any one of the preceding claims which in a
thickness ca 2mm allows less than 6% of laser power up to 8W incident power to pass
through.
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16. An elastomer material according to any one of the preceding claims having an
absorption coefficient in the range 1.0 – 2.5 mm⁻¹.

17. An elastomer material according to claim 16 having an absorption coefficient $1.5 - 2.2 \text{ mm}^{-1}$.
- 5 18. An elastomer material according to claim 18 having an absorption coefficient $1.4 - 1.6 \text{ mm}^{-1}$.
19. A closure for a pharmaceutical vial made wholly or partly of an elastomer material as claimed in any one of the preceding claims.
- 10 20. A closure for a pharmaceutical vial having a closure wall comprised of an elastomer material such that when laser light is directed on the outer surface of the closure wall 99% of the laser power is absorbed within $0.5 - 2.5 \text{ mm}$ depth from the outer surface with the effect of melting the material.
- 15 21. A closure for a pharmaceutical vial, made wholly or partly of a thermoplastic elastomer compounded with a colourant to the extent that less than 6% of laser light of wavelength 980nm at an incident laser power up to 8W penetrates through the closure to reach the interior of the vial or syringe.
- 20 23. A process for introducing a substance into a vial comprising: providing a vial having a mouth opening closed by a closure as claimed in any one of claims 19 to 21, passing a hollow needle through the closure, introducing the substance into the vial via the needle, withdrawing the needle from the vial and closure, and sealing the
- 25 residual puncture hole in the closure by heat sealing.
24. A process according to claim 23 wherein the heating of the elastomer material of the closure adjacent the puncture site so that the material fuses is done by directing laser light onto the elastomer material adjacent the puncture site.
- 30 25. A process according to claim 24 wherein the laser light has a power less than 20W .

26. A process according to claim 25 wherein the laser light has a power 4 – 10W.

27. A process according to any one of claims 24 to 26 wherein the laser beam has
5 a wavelength in the range 960-1000nm.

28. A process according to any one of claims 24 to 27 wherein the laser light is
directed at the elastomer material adjacent to the puncture site for a period of 0.5 – 2
seconds

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